PROGRAMMING CHALLENGES USING MATRICES

1. Place more than one ship on the battleship board in a random location for the user to find.

2. Make the ship larger, so that it takes up two or three locations on the grid of elements in the matrix. Give the outer limits of the ship different values than the middle of the ship. This way, you can give the player feedback on his or her guess. (eg. "You hit the front of the ship.")

3. Give the player hints in response to his or her guesses. For example, if the program player's guess for the row position is one away from the ship, PRINT "YOUR ROW GUESS IS HOT!" If the next row guess is more than one away from the ship's location, PRINT "YOUR ROW INDEX IS GETTING COLDER." Do the same for the column values.

4. Place friendly ships and enemy ships on the game board. Give the friendly ships one value and the enemy ships another value in order to differentiate the two. Keep score for the player. When an enemy ship is encountered, the player gains points. When an allies ship is hit, the player looses points.

5. Experiment with different graphics modes, drawing a grid, and displaying the actual ships on the screen.

××××× BATTLESHIP ×××××

```
100 REM ×       BATTLESHIP
110 REM ×
120 REM ×        INITIALIZE VARIABLES
130 REM ×
140 MAXLOCATIONS=4
150 DIM BOARD(MAXLOCATIONS,MAXLOCATIONS)
160 COLUMN=0:ROW=0
200 REM ×
210 REM ×        INIT MATRIX
220 REM ×
230 FOR ROW = 1 TO MAXLOCATIONS
240 FOR COLUMN = 1 TO MAXLOCATIONS
250 BOARD(ROW,COLUMN)=0
260 PRINT LOCATION(ROW,COLUMN)
270 NEXT COLUMN
280 NEXT ROW
```

××××× PLACE SHIP ×××××

```
400 REM ×
410 REM ×       PLACE SHIP
420 REM ×
430 SHIPROW = INT(RND(0)×40+1 :REM A RANDOM NUMBER
440 SHIPCOL = INT(RND(0)+4)+1 :REM BETWEEN 1 AND 4
450 BOARD(SHIPROW,SHIPCOL)=1 :REM ONE IS ASSIGNED TO RANDOM LOCATION
```

MATRICES

MATRICES
Camper Copy Continued

xxxxx PLAY xxxxx


```
700 REM x      PLAY
720 REM x
730 PRINT "TYPE IN THE COORDINATES OF"
740 PRINT "YOUR GUESS.  THE NUMBER MUST"
750 PRINT "BE BETWEEN 1 AND 4.
760 PRINT
770 PRINT "ROW: ";
780 INPUT ROWGUESS
790 PRINT "COLUMN: ";
800 INPUT COLGUESS
810 IF BOARD(ROWGUESS,COLGUESS)=1 THEN PRINT "YOU FOUND IT!":END
820 PRINT
830 PRINT "TRY AGAIN"
840 GOTO 770
```

```
1020 POSITION 0,3:PRINT #6;"R"
1030 POSITION 0,4:PRINT #6;"O"
1040 POSITION 0,5:PRINT #6;"W"
1050 POSITION 0,6:PRINT #6;"S"
1060 PRINT "  TYPE IN THE COORDINATES OF"
1070 PRINT "  YOUR GUESS.  THE NUMBER MUST"
1080 PRINT "  BE BETWEEN 1 AND 4."
1090 PRINT "ROW: ";
1100 INPUT ROWGUESS
1110 IF ROWGUESS<1 OR ROWGUESS>4 THEN 1090
1120 PRINT "COLUMN: ";
1130 INPUT COLGUESS
1140 IF COLGUESS<1 OR COLGUESS>4 THEN 1120
1150 IF BOARD(ROWGUESS,COLGUESS)=1 THEN GOSUB WIN:RETURN
1160 POSITION COLGUESS*4,ROWGUESS*2:REM PUT * ON BOARD
1170 PRINT #6;"*"
1180 PRINT :PRINT "TRY AGAIN"
1190 GOTO 1090
1300 REM *
1310 REM *        WIN
1320 REM *
1330 PRINT :PRINT "YOU FOUND IT!"
1340 FOR COUNT=1 TO 10
1350 POSITION COLGUESS*4,ROWGUESS*2
1360 PRINT #6;" ";:REM ERASE *
1370 FOR DELAY=1 TO 75:NEXT DELAY
1380 POSITION COLGUESS*4,ROWGUESS*2
1390 PRINT #6;"*";:REM FLASH *
1400 FOR DELAY=1 TO 75:NEXT DELAY
1410 NEXT COUNT
1420 RETURN
```

```
200 REM *
210 REM *       PLAY TUNE
220 REM *
230 FOR XNOTE = 1 to NUMNOTES
240 SOUND 0,TUNE(XNOTE),10,10
250 FOR DELAY = 1 TO 10: NEXT DELAY
260 NEXT XNOTE
270 SOUND 0,0,0,0
```

```
100 REM *  SOUND WITH AN ARRAY PLUS PLAY TUNE
110 REM *
120 DIM TUNE(100)
130 XNOTE = 0
140 INPUT PITCH
150 IF PITCH = -1 THEN NUMNOTES = XNOTE:GOTO 200
160 XNOTE = XNOTE + 1
170 TUNE(XNOTE) = PITCH
180 GOTO 140
200 REM *
210 REM *       PLAY TUNE
220 REM *
230 FOR XNOTE = 1 to NUMNOTES
240 SOUND 0,TUNE(XNOTE),10,10
250 FOR DELAY = 1 TO 10: NEXT DELAY
260 NEXT XNOTE
270 SOUND 0,0,0,0
```